



Geo Heat Pumps: Leading Energy Utility Marketing Programs

By Dr. Katherine Johnson

Fifth Edition

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Program Name: CO-Z Energy

Program Website: <http://www.dmea.com/geoex/co-zfacts.htm>



Corporate Website: <http://www.dmea.com>

Ownership: Rural electric cooperative

Number of Customers and Service Territory: Delta-Montrose Electric Association (DMEA) serves 28,000 customers in four southwest Colorado counties.

BACKGROUND

Delta-Montrose Rural Power Lines Association was organized in August 1938. DMEA is a private, non-profit cooperative owned by its members. DMEA has a history of developing innovative energy programs that have won praise and recognition at the regional and national level.

“I think DMEA is one of the most innovative co-ops in the country,” said Peggy Plate, former Energy Services Manager for the Department of Energy’s Western Area Power Administration (WAPA).



History

Reasons for program, past/recent activities/programs and or primary drivers. DMEA developed its GeoExchange program as a way to provide service using the concept of “chauffage” or guaranteeing heating bills. Chauffage is a popular financing plan used in Europe and its intent is to lower energy costs by financing the installation of energy efficient technologies and then recouping the investment from the energy savings from these installations. DMEA took this concept into the single-family residential market a step further than the Europeans in designing its geothermal program.

DMEA’s program is called “CO-Z,” and “the intent is to remove the first cost barrier” associated with GHP installations, said Paul Bony, DMEA’s marketing and customer service manager. “DMEA took the loop lease concept to the next level through the development of the chauffage concept.”



DMEA viewed this program as a way to target both new construction and existing home (retrofit) markets. Targeting the retrofit market offered a new opportunity to increase GeoExchange installations in DMEA’s service territory, while installations in the new construction market would allow DMEA to reach new members as they moved into its territory.

According to the co-op’s research, forced-air fossil fuel systems accounted for approximately 50 percent of the total systems in its territory. This represented an attractive target market for GHPs as a strategy to convert current gas and propane members to GeoExchange systems.

One senior DMEA staff member explained that the retrofit arena made an ideal target market for GeoExchange installations “because the duct work was already in place.” GeoExchange would be positioned as a split-system — offering geothermal heating and cooling with a gas or propane back-up heating source.

The co-op also identified “basic houses” as sites for pilot GeoExchange installations. “We targeted houses that had existing gas furnaces...houses that weren’t really tight,” a DMEA staff member explained. This was done deliberately to determine if it was possible to retrofit existing homes with geothermal systems.

DMEA also wanted to increase GeoExchange installations within the new construction market so the co-op approached builders. Historically, custom builders and higher-end customers in the new construction market have been an easier market in which to promote new technologies such as GeoExchange because financing costs can be included in the mortgage. It is also often easier to install the necessary equipment as a new home is built.

The Co-Z program has been in continuous development for the past four years, because it was necessary to gather all the energy information required to properly calculate the actual operating costs of geothermal systems. But the Co-Z program is not like traditional ESCo financing programs, because DMEA does not monitor actual energy consumption. Rather, the cooperative relies on the energy model it created to guarantee the GeoExchange energy consumption.

This program also fits in with the overall corporate strategy of DMEA. “GeoExchange systems support our board of directors’ vision of providing a variety of high-quality, affordable energy services to our members,” says Dan McClendon, DMEA’s general manager.

From an economic point of view, geothermal systems represent high load factor and low peak load impacting kilowatt-hour sales to the cooperative. “We are making more money on kilowatt hour sales and we are recouping our expenses for advertising, sales and installation through an imbedded fee,” Bony explained.

Relevant Program Name & Description Co-Z Energy

In the Co-Z program, DMEA pays for the installation of major components of a GHP (GeoExchange) system for a homeowner. The program does not include ductwork or other “inside the house” elements. The program originally relied on outdoor split GeoExchange equipment. In 2002, the co-op expanded its Co-Z offering to include more options including package systems and a loop only payment option.

Price/Cost to Customer

The Co-Z Energy Plan is a monthly service agreement between the customer and DMEA. The plan includes the following elements:

- Custom design of a geothermal system
- Installation of the outdoor portion
- Ongoing maintenance and repair
- An energy credit rate lock, adjustable in five-year intervals based on the system’s estimated energy usage

The Co-Z Energy Credit is intended to cover the majority of the system’s estimated energy operating costs averaged over 12 months. Steve Metheny, chief operating officer, explained: “The GeoExchange system is financed for 50 years on a monthly lease payment that includes equipment maintenance. The lease is about \$66 per month for my system and that includes financing the outside unit and the split system duct work.” However, the monthly cost is much lower compared to the monthly costs to heat with propane. “It costs about \$1,400 a year to heat with propane and that is without any air conditioning compared to the geothermal system that provides heating and air conditioning for about \$320 to \$420 per year,” Metheny said.

Dates Offered: Pilot efforts began in 1997 and the formal program was launched in September of 1998. ***How/Where***

Marketed

DMEA promotes its CO-Z program by building awareness of geothermal systems and creating a culture among geothermal owners.

“People are not exposed to geothermal and they don’t understand the benefits. We educate the population about the process and the overall concept,” Bony said.

For example, DMEA has enlisted a well-known geothermal expert, Doug Rye, to talk to prospective owners about the benefits

that geothermal systems offer, especially in New Jersey in conjunction with building an energy efficient home.

The Co-Z program is also promoted in articles in the cooperative's newsletter, on displays at the annual meeting, and on the co-op Website.

DMEA is also creating a "geo culture" among system owners. "Sales is a one-on-one process, but when we hit the hundred mark with installations, then we invited all the geo customers to a dinner... We are building a culture for everyone and using it for future referrals," Bony said. The cooperative is also "looking for better ways to streamline the (installation) process and better ways for real estate professionals to understand geothermal systems," he added.

Number of Customer Sign-ups

According to DMEA, 500 sales have been recorded to date at year-end for geothermal systems, but that doesn't count sales of GHPs by other installers in other markets in Colorado.

"Another market is opening up in Durango, CO, and three neighboring utilities are now asking us to work with them to promote GeoExchange in their service area doing something (in geothermal)," Bony said. This includes Xcel Energy, one of the largest investor-owned utilities in the country.

Key Vendors/Partners/Allies

DMEA took a unique approach to developing relationships with trade partners. Since there wasn't an infrastructure in place to support a geothermal program, DMEA set out to develop it. The electric cooperative is the owner of a heating and air conditioning company called *Intermountain Energy Services One*, owns a stake in a GHP manufacturing company called Co-Energies, and has been providing research and development assistance to a drilling company called *TEI Rock Drilling*. "We started up our own HVAC company with the goal of controlling our pricing, quality and customer care. We became profitable this year," Bony said. *Intermountain Energy Services One* installs and services the geothermal systems sold as part of the CO-Z program.

Despite all the growing pains, DMEA set into motion the elements required to grow a sustainable geothermal market. In that way, DMEA has already distinguished itself from the scores of other utility programs that have offered geothermal programs and achieved limited success.

Key Reasons For Success/Failure

Although DMEA has been successful in its geothermal program, technological barriers still exist that hamper market development. For example, DMEA reported manufacturing defects with some of the geothermal systems installed, and problems with the electronic thermostats used. Bony said he believes manufacturers may be losing their enthusiasm for the geothermal market. "The manufacturers are cutting back and have the philosophy of not worrying about the installations. They are getting out of the residential market," he explained.

"Technical support from the equipment manufacturers is way down compared to 10 years ago," he added.

Contributing to the problem of diminished manufacturer support is the growing shortage of skilled geothermal technicians. "The average HVAC technician is middle aged and we are hitting the wall with technical talent," Bony said. "We cannot get enough good technicians...there is a shortage of skilled technicians available."

Lastly, DMEA's staff also worries about the relatively low level of awareness of geothermal technology. "We promote the program via word-of-mouth and through our campaigns, but there is still only a 50 percent awareness of geothermal."

He summed up the reasons for geothermal's continual failure to expand nationwide: "There is no long-term philosophy in this market, no long-term investment. Utilities might support it but the utility market is not stabilized...GeoExchange is under-funded."

LESSONS LEARNED

DMEA illustrates several critical lessons that are important to understand for a utility that wants to develop a successful geothermal program:

- **Think outside the box.** DMEA took a sophisticated but little used European financing tool to form the basis of its geothermal “lease” program. Chauffage is not commonly used among utilities, especially rural electric cooperatives, because it requires investment and entails market risk. However, as DMEA has demonstrated, this risk can be managed through careful modeling, and it can be profitable. DMEA estimates that it will net \$700,000 in present value revenues from the first 150 geothermal installations they have so far -- a pretty handsome return on a \$200,000 investment.
- **Don’t depend on others to create the geothermal program.** DMEA had many reasons not to develop and deploy a geothermal program. The manufacturers have taken a step back from the market and so have many utilities. Moreover, there is a critical shortage of skilled technicians. Installers, and drillers charge market-busting rates. But DMEA didn’t let any of these obstacles stop them from pursuing the market. Rather, they created the market themselves. They solved the problem of the lack of skilled technicians by creating their own heating and air conditioning company to focus exclusively on the installation of geothermal systems. They are working on new drilling methods and have invested their own funds in a direct-exchange geothermal system that minimizes the hassle and cost of equipment installation, while opening the market to include small lot homes. In other words, they depended on themselves to make the program successful – with no excuses.
- **Create a “geo culture”.** DMEA also learned the importance of building on previous success. By fostering a sense of community among GHP owners, DMEA has developed a powerful internal sales force. This sense of camaraderie is especially effective within a member-owned cooperative, where community ties are strong.

Best Way to Learn of New Developments: From the Website, newsletter and the trade press.

Key Staff Individuals

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Company Description

FHP was acquired by Bosch in 2007, as part of the company's larger strategy to establish itself in the heat pump market on a global scale. In addition to purchasing FHP, a leading provider of geothermal heat pumps, the company previously acquired the largest manufacturer of electric heat pumps in Sweden in order to become a major player in the European markets. Both these moves are viewed as part of Bosch's overall strategy to position itself more strongly in the European markets rather than increasing its overall market position in the U.S.

The GHP business is operated as part of Bosch's Thermotechnology Division, headquartered in New Hampshire. This division has been active in promoting renewable energy technologies since 2005 and includes a broad range of equipment such as water heating, solar photovoltaics, and integrated energy solutions for the commercial and industrial sectors.

FHP, the geothermal heat pump manufacturing division, has been a leader in the industry in building both water source and GHP heat pumps. The company offers a full product line for both the residential and commercial markets. FHP has a strong reputation in building quality equipment, and its manufacturing operations are based in its Fort Lauderdale location.

The assimilation of FHP into the Bosch product line has been slow and steady. As one industry insider observed:

"Bosch has taken its time with FHP. They have been very patient in how to approach the U.S. market and are gradually rebranding it FHP-Bosch. The major push is they are integrating the business with a broader thermo technical concept... they have completely redesigned the company's brand and have integrated it with Bosch pushing the market. It has just been very slow but you see the change in where they are marketing the products."

Other GHP manufacturers have been also watching Bosch's integration with FHP to determine if the firm is gearing up for a big push in the U.S. or abroad. So far, there are two theories according to industry insiders as summarized in the following observations:

"The industry forecast is that the Germans bought FHP so that they could have a deep U.S. manufacturing capability to take GHPs back to Europe and focus on that market. They could be a big presence in the European market compared to other players like ClimateMaster."

"Bosch has deep pockets and market muscle."

These observations suggest that the GHP community recognizes that FHP-Bosch will be a major player in the industry going forward. However, the company's reluctance to support the newly revitalized and rebranded GEO has been somewhat of a surprise. While the company is active in a number of trade associations, such as IGSHPA and AHRI, FHP has not taken as active a role in supporting GEO compared to ClimateMaster, WaterFurnace and GeoComfort (EnterTech). This was viewed as "surprising" given that the company is positioning itself as a player in the U.S. market.

History

The company was founded in 1969 and specializes in water source and GHPs. In January 2007 it was purchased by BOSCH. Bosch LLC's consumer goods and building technology division also got a boost in 2008. The company cut the ribbon on an expanded production plant for geothermal heat pumps, used in residential climate control. The general view is that the company is becoming "very German" in its outlook.

Number of Employees: 195

Market Position

FHP-Bosch is in the Top Three overall in the water source and geothermal industry.

Relevant Product Name and Description

Residential Products

Water Source and Geothermal Heat Pumps

Residential Product Finder

Series	Water to Air	Water to Water	Ultra Efficiency	Superior Efficiency	Extreme Efficiency	High Efficiency	Size (in tons)
AP	√				√	x	2
AP Split	√				√		2
EC	√					√	½ - 6
ES	√		√				1 ½ - 6
ES 2 Stage	√		√				2 - 6
EV	√		√				1 ½- 6
WT		√			√		2 - 6
WW 1 Stage		√	√				2-6

Commercial Product Finder

Series	Water to Air	Water to Water	Ultra Efficiency	Superior Efficiency	Extreme Efficiency	High Efficiency	Size (in tons)
RT	Energy Recovery Rooftop Heat Pump						
AP	√				√		2 - 6
EP	√				√		.5 - 6
CA	√		√			√	3/4 - 1 1/2
EC	√					√	1/2 - 6
EC Large	√					√	6 - 30
ES	√		√				1 1/2- 6
ES 2 Stage	√		√				2 - 6
EV	√		√				1 1/2- 6
MC	√		√				30 - 60
TRS	√			√			3 - 35
WW 1 Stage		√		√			2 - 6
WW 1 Stage		√		√			10 – 17 1/2
WW 2 Stage		√		√			10, 20 - 35

Table 2: Summary of Key Product Specifications for FHP-Bosch's GHPs for Commercial

Series	Water to Air	Water to Water	Size Range	Sizes Available (Tons)	Efficiency (GLHP)	Efficiency (WLHP)
AP	√		AP025-AP071	2,3,4,5,6	EER:18.0-28.5 COP:4.1-4.8	EER: 16.0-20.0 COP: 5.1-6.5
ES	√	x	ES018-ES070	1.5,2,2.5,3,3.5,4,5,6	EER: 15.6-19.6 COP::3.3-3.5	EER: 13.6-16.0 COP: 4.3-5.6
ES 2 Stage	√		ES025-ES071	1.5,2,2.5,3,3.5,4,5,6	EER: 15.5-24.5 COP: 3.6-4.0	EER: 13.5-17.5 COP: 4.4-5.4
EV	√		EV018-EV070	1.5,2,2.5,3,3.5,4,5,6	EER: 15.0-18.5 COP: 3.3-3.4	EER: 13.0-15.5 COP: 4.2-5.4
EC	√		EC007-EC070	0.5, 0.75, 1, 1.25, 1.5, 2, 2.5, 3, 3.3, 3.5, 4, 4.25, 5, 6	EER: 14.1 – 15.8 COP: 3.1-3.6	EER: 12.5 – 14.0 COP: 4.2 - 5.1
EC Large	√		EC072-EC360	6,8,10,12.5,15,17.5, 20,25, 30	EER: 14.0 – 17.9 COP: 3.2-4.2	EER: 13.0-16.0 COP: 4.2-5.6
CA	√		CA009-CA018	0.75,1,1.25,1.5	EER”14.0-16.0 COP:3.1-3.3	EER”12.0-13.3 COP:4.2-4.6
WW		√	WW024-WW072	2,3,4,5,6	AHRI has no rating for WW units according to (AR/ISO 13256-1)	
WW		√	WW1120-WW210	10,15,17.5		
WW 2 Stage		√	WW122	10	AHRI has no rating for WW units according to (AR/ISO 13256-1)	
WW 2 Stage		√	WW 240-WW420	20.30.35		
MC		√	MC360	30	Units are only rated up to 130 Thsd. BTUH	
MC		√	MV480-MC720	40,50,60		
TRS		√	TRS036-TRS084	3,4,5,6,7	EER: 14.1-18.5 COP:4.85-5.61	EER:126-16.4 COP:4.2-5.61
TRS		√	TRS096-TRS360	8,10,12.5,1517.5,20, 25,30		
TRS		√	TRS420	36		

Strategic Alliances

FHP works closely with leading Energy Service Companies around the country. For example, FHP has worked closely with AMERESCO and Co. Energy to provide over 3000 installations in military facilities.

Primary Competitors

ClimateMaster, Trane and WaterFurnace

Competitive Strengths: The acquisition by Bosch has strengthened its overall market presence in both the residential and commercial markets - and it is likely to remain a major player in the GHP markets. It has also begun to successfully integrate FHP's core competencies—that is excellent product design and strong knowledge of the U.S. market, to its larger focus on energy efficiency and renewable energy offerings through its Thermotechnology Division.

Its strong combination of in-depth understanding of the GHP product, the market drivers, and the ability to offer more comprehensive solutions to residential and commercial customers will make FHP-Bosch a formidable competitor to the other “big three” GHP manufacturers in the next few years.

Competitive Weaknesses: Although, FHP-Bosch is one of the largest water source and geothermal manufacturers, it does not have the name recognition of its well-known competitors yet. It also has to determine if it wants to create increased awareness in the US markets or just use its manufacturing capabilities from FHP to dominate the European heat pump market.

FHP has worked on major geothermal installations around the world. It has also worked closely with most of the large investor-owned utilities and rural electric cooperatives.

Total Number Deployed (products and utilities)

FHP has sold thousands of systems around the world, particularly in schools, military bases, residential and institutional applications.

How/Where Product Sold

FHP uses independent wholesalers and commercial representatives throughout the United States and also exports equipment for overseas sales. Through Bosch, it has more than 300 representatives worldwide.

Best Way to Learn of New Developments: Website

Key Individual: Cliff Young, President